

2500 Automatic Tank Gauge

Mechanical float gauge for continuous level measurement in storage tanks



2500 Automatic Tank Gauge (ATG) left with 2520 High Pressure version above

Applications

The Model 2500 Automatic Tank Gauge (ATG) is a float and tape operated instrument designed to provide continuous liquid level measurement in bulk storage applications. The Model 2520 High Pressure Automatic Tank Gauge is specifically designed for pressurized vessels. Endress+Hauser Systems & Gauging has maintained these simple and reliable products, which have been the market leaders in float and tape instrumentation for over 50 years.

Features

- Low cost continuous measurement – 0.2" (4 mm) accuracy per SIRA Report E1588583
- Units of measurement to suit your requirements – Metric or Imperial in decimals or fractions
- Wide variety of material available for extreme products or environmental conditions
- Cone roof, floating roof and bolted tank kits available for stilling wells or water interface applications
- Mounting for optional transmitters or limit switches for future site upgrades
- 150 and 300 PSIG (1136 and 2170 kPa) service ratings for the Model 2520
- Sphere, horizontal cylinder and top mount kits for the Model 2520

Measuring System

The 2500 ATG is designed to provide continuous liquid level measurement for bulk storage applications. It displays liquid level at the gaugehead mechanically. If electronic transmission of level data is required in the control room, then the 2500 ATG can be fitted with an optional Endress+Hauser tank gauging transmitter.

Operation

As standard, the 2500 ATG utilizes a large stainless steel float that is attached to the stainless steel perforated tape to detect the liquid level. The float follows the liquid level as it rises and falls due to the constant pullback tension provided by a powerful negator spring or cartridge motor. The precisely perforated tape engages pins on a sprocket wheel that in turn drives the counter assembly and any shaft position devices attached to the gaugehead, such as a transmitter. This simple design and operation allows the gauge to perform with negligible maintenance throughout its working life.

The Model 2520 High Pressure Automatic Tank Gauge is designed to provide continuous liquid level measurement of products stored in pressurized vessels. The 2520 requires specific considerations or options for installation on high pressure vessels. The magnetic drive operates the dial reading mechanism, as well as a transmitter or other auxiliary equipment. It provides a positive seal-off of the counter compartment and the transmitter housing, eliminating danger of glass breakage, loss of product and the escape of vapors, making it an important safety feature for both personnel and plant facilities.

Installation

The 2500 ATG and 2520 ATG have various installation options and accessories to suit user accuracy and installation requirements for virtually every application. They may be mounted on the tank roof or at grade level, which would facilitate ground level reading by the operator. The 2500 ATG can be installed on the following types of tanks while the tank is in service:

- Internal and external floating roof tanks
- Fixed roof tanks

Endress+Hauser recommends guidewire installations for the 2500 and 2520 ATGs, with standard guidewire centers of 17" (432 mm). A 14.5" (368 mm) diameter Type 316 stainless steel hollow shell float is provided with the 2500 ATG for use with all standard applications.

The 2520 ATG is provided with a standard 8" (203 mm) diameter multi-sphere 316 stainless steel float. In order to ensure the highest possible measurement accuracy, the specific gravity of the product being measured is required to properly adjust the weight of the float.

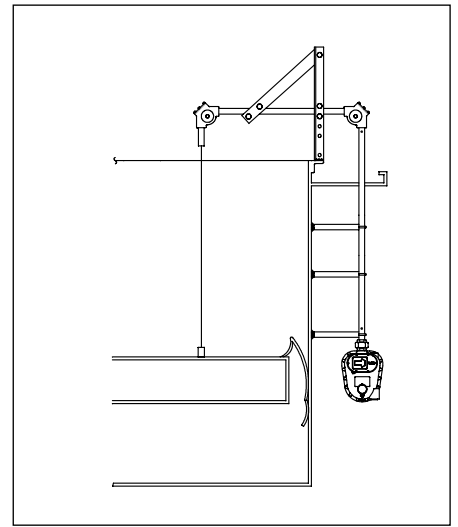
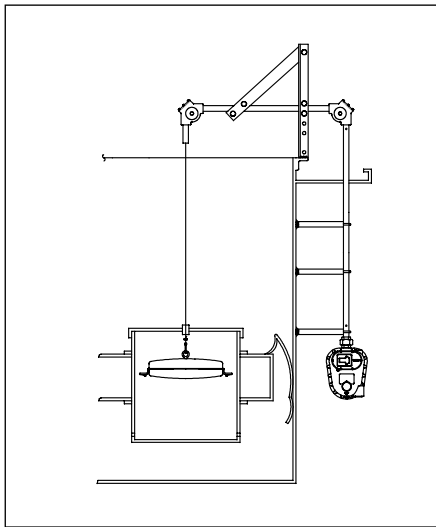
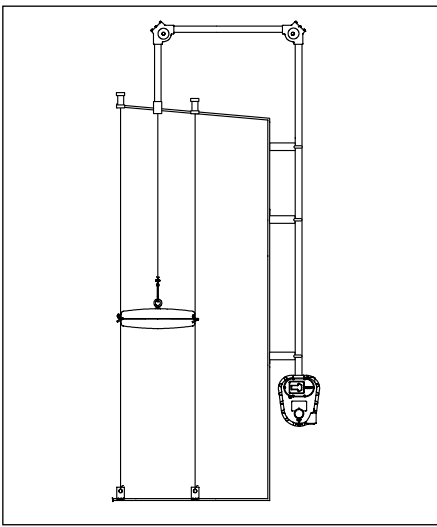
Standard and Optional Features

Endress+Hauser provides either Imperial fractional, decimal or Metric configurations with counter displays in feet/inches/16ths, feet/inches/10ths or meters/10ths/100ths. Imperial reading gauges are manufactured with a reversible fractional/decimal dial. If the customer desires a decimal level display, the dial can be removed, reversed and reinstalled to show decimal units. All dial/counters reflect product innage. For outage reading requirements, Endress+Hauser offers a modification kit (P/N 13-08774) for Imperial units of measure only.

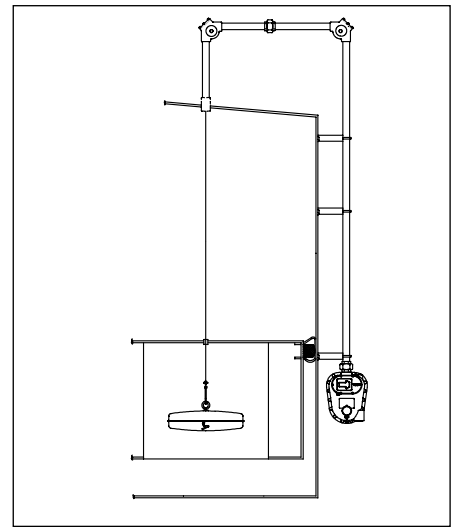
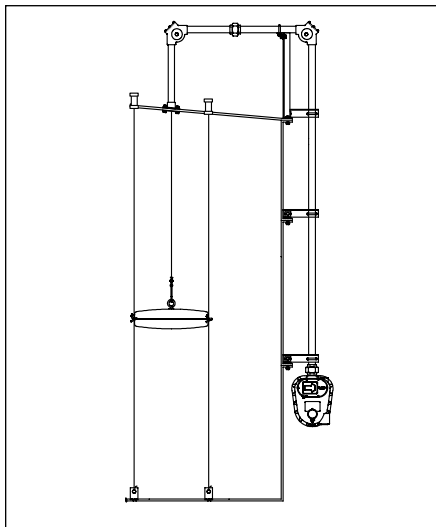
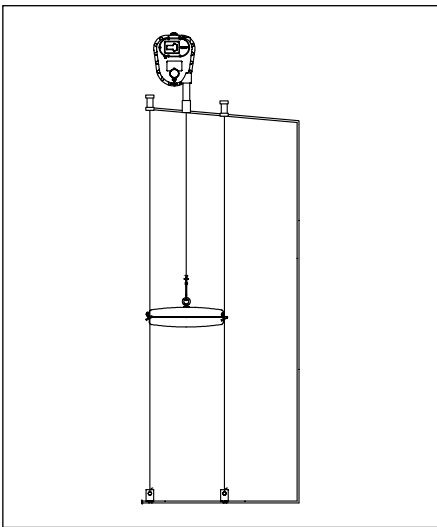
Endress+Hauser recommends the use of the Model 275 Rubber Plug Gate Valve when installing the 2520 on high pressure vessels. This permits the user to seal off tank working pressure from the gaugehead and tape piping system for routine inspection and maintenance. The plug valves have 1-1/2" (38 mm) ANSI RF flanges, Viton-A plug and are rated for either 150 or 300 PSIG (1136 and 2170 kPa) service.

When directly mounting a transmitter or SPDT cam-operated limit switch to the 2520, Endress+Hauser recommends the use of a 2581 (Oil Tight) Transmitter Adapter.

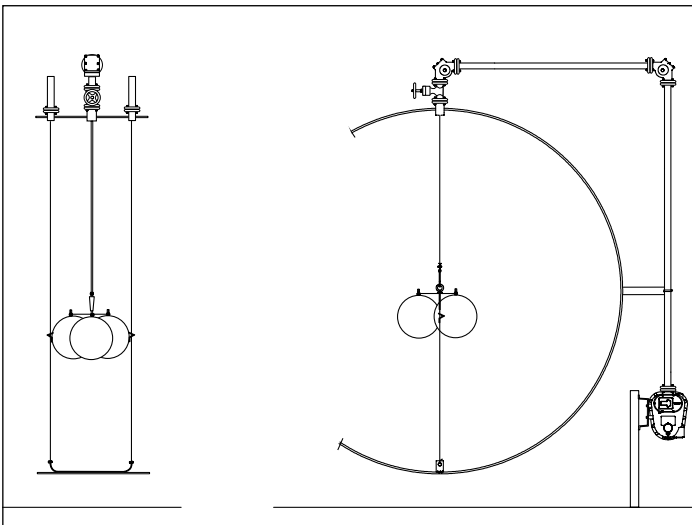
An operation checker is provided as a standard feature on both the 2520 and 2500 ATG, which permits your technician to check the instrument for proper operation. Other design considerations, such as the self adjusting tape keeper, ensure the highest reliability and performance available.



Left: Cone roof tank, Center: Floating roof tank, floatwell type, Right: Floating roof tank without floatwell



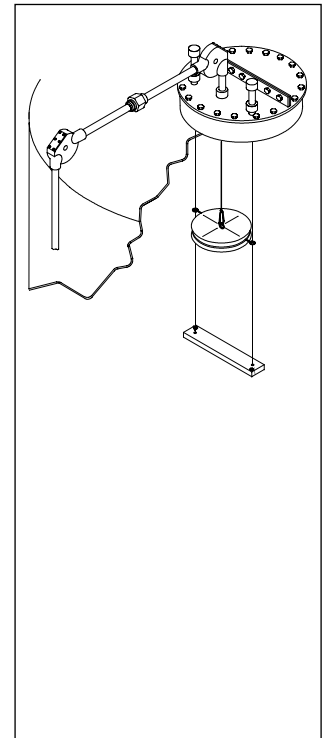
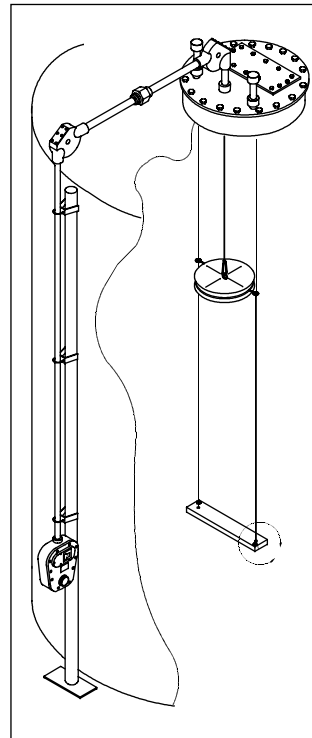
Left: Top mounting for cone roof tank, Center: Bolted cone roof tank, Right: Cone roof tank with internal floating roof and pan



Left:
Typical 2520 installation on sphere tank with 275 Rubber Plug Gate Valve

Center:
Installation with 228 Inspection Cover

Right:
Installation with 226 Manhole Cover



Accessories

2546 Teflon Tape Wipe

Part #BA13924

Generally used with the conduit vent, the tape wipe can also be used alone. The wipe mounts in the conduit between the top of the tank and the first elbow and removes excess residue from the tape. It minimizes vapor loss from the tank into the conduit and helps prevent vapors and liquids from contaminating the gaugehead.

Dual Calibrator Assembly

Part #13-08948

The dual calibrator allows level transmitters with absolute encoders to be calibrated without disassembling the transmitter from the gaugehead. The calibrator is accessed by removing the counter assembly cover. By simply turning the calibrator, the counter and the transmitter can both be set to the proper level. The dual calibrator can be retrofitted to existing 2500 ATG installations.

Extended Range Kit

Part #13-08772 (Imperial) #13-08773 (Metric)

The extended range kit provides an extra long gauge tape and negator motor to extend the range to 96 ft (29 m). It is not available for cartridge equipped gauges.

Outage Conversion Kit

Part #13-08774

This kit allows the conversion of standard innage reading gauges to outage. It is only available for Imperial gauges.

Imperial to Metric Conversion Kit

Part #BM16541

This kit provides necessary parts and instructions for converting Imperial gauges to Metric gauges. Metric tape must be purchased separately.

2545 Condensate Reservoir

Part #BM4051

The condensate reservoir is designed to collect condensate that would otherwise accumulate in the gaugehead. Its use is recommended where an excessive amount of condensate could develop.

Shock Absorber

Part #DA6138

The Shock Absorber reduces wear and maintenance on a 2500 ATG by minimizing the transfer of wave energy from the float to the perforated tape and gaugehead components. It prevents the float from becoming detached from the tape by wave action and should always be used in tanks with turbulent conditions near inlet or outlet piping and near a mixer.

2542 Tape Conduit Vent

Part #1M4084

This vent is designed for use on liquid level gauging installations on storage tanks where corrosive vapors are involved. The unit vents gauge piping to the atmosphere, thereby preventing vapors from entering the gaugehead. Special construction is designed to prevent damage to the vent due to pipe alignment.

226 Manhole Cover

Part #BM3443 (20") #BM3607 (24")

This cover allows for in-service installation of the 2500 ATG through a tank's existing manway.

228 Inspection Cover

Part #BM6746

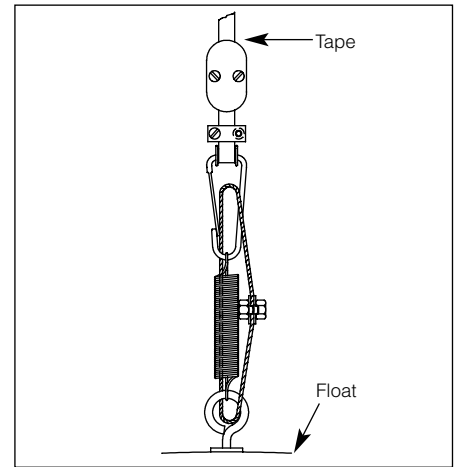
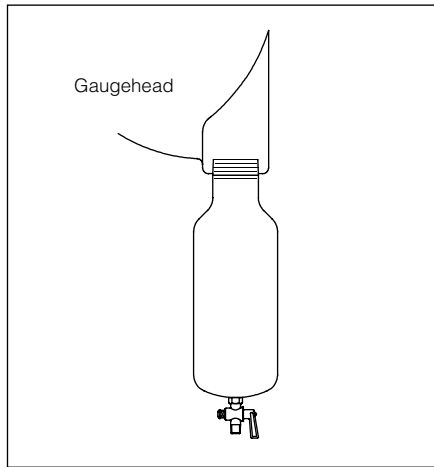
This cover functions the same as the 226 Manhole Cover, but features an easily removable inspection plate.

Communication Options

Transmitter	Model 4000 ATT Model 8200
Limit Switch	Model 2557

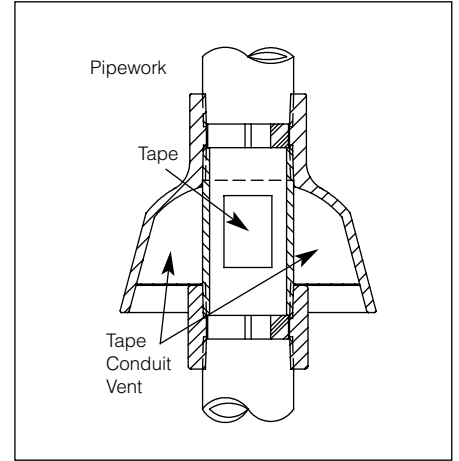
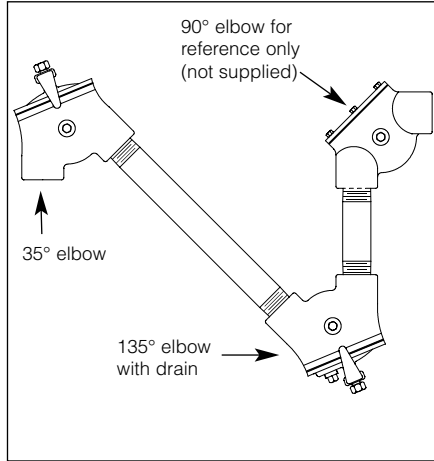
Left:
2545 Condensate
Reservoir

Right:
Shock Absorber



Left:
Oil Seal Assembly

Right:
Tape Conduit Vent



Technical Data

Model 2500 ATG

Service Type

Description	Standard	Moderate	Severe	Extreme (NaOH)	Extreme (H ₂ SO ₄)
Gaugehead	Aluminum	Aluminum	Cast Iron	Cast Iron	Cast Iron
Sheave Elbows	Aluminum	316 S.S.	Cast Iron	Cast Iron	Cast Iron
Top Anchors	Steel	316 S.S.	Steel	Steel	Stl/Carp. 20
Bottom Anchor	Steel	316 S.S.	316 S.S.	Monel	Carp. 20
Guide Cables	316 S.S.	316 S.S.	316 S.S.	Monel	Carp. 20
Perforated Tape	316 S.S.	316 S.S.	316 S.S.	Monel	Carp. 20
Hollow Shell Float	316 S.S.	316 S.S.	316 S.S.	Monel	Carp. 20

Float Specifications

Part Number	Material	Net Weight	Size
BM9074-000	316 S.S.	8.8 lb (4 kg)	14.5" (368 mm)
BM12339-000	Carp. 20	10.7 lb (4.9 kg)	17" (432 mm)
BM12338-000	Monel	10.5 lb (4.8 kg)	17" (432 mm)

Oil Seals

	Max Working Pressure	Part Number	Service
Aluminum Sheaves, Steel Pipe	8.5" (216 mm) W.C.	10-01994-AAA	Standard
Cast Iron Sheaves, Steel Pipe	8.5" (216 mm) W.C.	10-01994-BAA	Severe
Aluminum Sheaves, Steel Pipe	27" (686 mm) W.C.	10-02861-AAA	Standard

Technical Specifications

Product Gravity Range	0.7 to 1.9 (specific gravity)	
Service Rating	Atmospheric to 2.5 PSIG (119 kPa)	
Gauging Range	0 – 60 ft (18 m)	
Extended Range	0 – 96 ft (29 m) Fixed Roof Tanks Requires Kit 13-08772 (Imperial) or 13-08773 (Metric)	
Shipping Weight	Varies with model – 70 lb (32 kg) to 110 lb (50 kg)	
Sheave Elbows	90° Aluminum Sheave	06-0856
	90° Cast Iron Sheave	BM4675
	90° 316 Cast Iron Sheave	BM5074
	135° Aluminum Sheave	BM3480
	180° Aluminum Sheave	BM3481
	Aluminum Tape Carrier	BM3621

Model 2520**Technical Specifications**

Gauge Body & Cover	Cast Carbon Steel ASTM A 216, WCB
Counter Housing & Cover	Aluminum 356-T6
Sprocket Sheave	Cast Aluminum
Motor Storage Sheave	Cast Aluminum
Tape Storage Sheave	Cast Aluminum
Negator Spring	Type 301 Stainless Steel
Perforated Tape	Type 316 Stainless Steel
Sprocket Pins	Type 303 Stainless Steel
Bearings	Stainless Steel
Gauge Float	Type 316 S.S.
Service and Flange Ratings	Feature Options No. 252001XX & 252002XX:150 PSIG (1136 kPa) Feature Options No. 252003XX & 252004XX:300 PSIG (2170 kPa)
Operating Temperature Ranges	-30 °F (-34 °C) to +160 °F (+71 °C)
Gauging Range	0 – 60 ft (18 m)

Mounting Kits

Sheave Housing & Cover	Cast Carbon Steel ASTM A216, WCB
Sheave Wheel	Type 316 S.S.
Sheave Wheel Bearing	Teflon®
Top Anchor	Carbon Steel
Top Anchor Spring	Carbon Steel ASTM A229 CL
Bottom Anchor	Carbon Steel ASTM 575 Grade M-1020
Mounting Brackets	Carbon Steel ASTM 575 Grade M-1020
Guide Cable	3/32", Type 316 S.S.

Product Structure

Aluminum Gaugehead – Imperial Configuration – Negator Motor

Tank Type	
T01	Standard service cone roof tank
T02	Standard service cone roof tank with pan & floatwell
T03	Standard service floating roof tank & floatwell
T04	Standard service tank top mounting
T05	Standard service bolted tank
T06	Standard service floating roof tank; no floatwell
T07	Standard service cone roof tank & pan; no floatwell
T41	Moderate service cone roof tank
T51	Interface service cone roof tank; 15 min s.g. differential
T52	Interface service cone roof tank; 25 min s.g. differential
T55	Stilling well service cone roof tank 6" dia. float

250001

Aluminum Gaugehead – Metric Configuration – Negator Motor

Tank Type	
T11	Standard service cone roof tank
T12	Standard service cone roof tank with pan & floatwell
T13	Standard service floating roof tank & floatwell
T14	Standard service tank top mounting
T15	Standard service bolted tank
T16	Standard service floating roof tank; no floatwell
T17	Standard service cone roof tank & pan; no floatwell
T42	Moderate service cone roof tank
T53	Interface service cone roof tank; 15 min s.g. differential
T54	Interface service cone roof tank; 25 min s.g. differential

250003

Aluminum Gaugehead – Imperial Configuration – Float Crank

Tank Type	
T01	Standard service cone roof tank
T05	Standard service bolted tank

250002

Aluminum Gaugehead – Metric Configuration – Float Crank

Tank Type	
T11	Standard service cone roof tank

250004

Iron Gaugehead – Imperial Configuration

Tank Type	
T21	Severe service cone roof tank
T22	Extreme service cone roof tank; monel
T23	Extreme service cone roof tank; carp.20

250005

Iron Gaugehead – Metric Configuration

Tank Type	
T31	Severe service cone roof tank
T33	Extreme service cone roof tank; monel
T34	Extreme service cone roof tank; carp.20

250006

Aluminum Gaugehead – Imperial Configuration – Cartridge Motor

Tank Type	
T01	Standard service cone roof tank
T02	Standard service cone roof tank with pan & floatwell
T03	Standard service floating roof tank & floatwell
T04	Standard service tank top mounting
T05	Standard service bolted tank
T06	Standard service floating roof tank; no floatwell
T07	Standard service cone roof tank & pan; no floatwell
T41	Moderate service cone roof tank

250011

Aluminum Gaugehead – Metric Configuration – Cartridge Motor

Tank Type	
T11	Standard service cone roof tank
T12	Standard service cone roof tank with pan & floatwell
T13	Standard service floating roof tank & floatwell
T14	Standard service tank top mounting
T15	Standard service bolted tank
T16	Standard service floating roof tank; no floatwell
T17	Standard service cone roof tank & pan; no floatwell
T42	Moderate service cone roof tank

250013

Steel Gaugehead – Imperial Configuration – 150 PSIG (1136 kPa)

Tank Type	
T01	Spheres to 16 ft (4.9 m) diam. or horizontal cylinder tanks
T02	Spheres to 48 ft (14.6 m) diameter
T03	Top mounting on spheres or horizontal cylinder tanks
T04	Spheres to 60 ft (18.3 m) diam. or horizontal cylinder tanks

Plug Valve	
T0	Plug Valve not used
T1	1-½" (38 mm) Plug Valve (Viton -A plug)

Transmitter Adapter	
T0	Transmitter Adapter not used
T1	2581 Transmitter Adapter

252001

Steel Gaugehead – Metric Configuration – 150 PSIG (1136 kPa)

Tank Type	
T01	Spheres to 16 ft (4.9 m) diam. or horizontal cylinder tanks
T02	Spheres to 48 ft (14.6 m) diameter
T03	Top mounting on spheres or horizontal cylinder tanks
T04	Spheres to 60 ft (18.3 m) diam. or horizontal cylinder tanks

Plug Valve	
T0	Plug Valve not used
T1	1-½" (38 mm) Plug Valve (Viton -A plug)

Transmitter Adapter	
T0	Transmitter Adapter not used
T1	2581 Transmitter Adapter

252002

Steel Gaugehead – Imperial Configuration – 300 PSIG (2170 kPa)

Tank Type	
T05	Spheres to 16 ft (4.9 m) diam. or horizontal cylinder tanks
T06	Spheres to 48 ft (14.6 m) diameter
T07	Top mounting on spheres or horizontal cylinder tanks
T08	Spheres to 60 ft (18.3 m) diam. or horizontal cylinder tanks

Plug Valve	
T0	Plug Valve not used
T1	1-½" (38 mm) Plug Valve (Viton -A plug)

Transmitter Adapter	
T0	Transmitter Adapter not used
T1	2581 Transmitter Adapter

252003

Steel Gaugehead – Metric Configuration – 300 PSIG (2170 kPa)

Tank Type	
T05	Spheres to 16 ft (4.9 m) diam. or horizontal cylinder tanks
T06	Spheres to 48 ft (14.6 m) diameter
T07	Top mounting on spheres or horizontal cylinder tanks
T08	Spheres to 60 ft (18.3 m) diam. or horizontal cylinder tanks

Plug Valve	
T0	Plug Valve not used
T1	1-½" (38 mm) Plug Valve (Viton -A plug)

Transmitter Adapter	
T0	Transmitter Adapter not used
T1	2581 Transmitter Adapter

252004

Supplementary Documentation

❑ 2500 Automatic Tank Gauge
System information
Si 016G/03/ae

❑ 2557 Limit Switch
Technical information
Ti 023G/03/ae

❑ 4000 Advanced Technology
Transmitter
Technical information
Ti 009G/03/ae

❑ 8200 Current Output Transmitter
Technical information
Ti 021G/03/ae

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